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(54) **THERMAL MANAGEMENT FOR HIGH-POWER OPTICAL FIBERS**

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See application file for complete search history.

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(57) **ABSTRACT**

A method includes obtaining a substrate having at least one exposed metal surface. The method also includes electro-depositing metal onto the at least one exposed metal surface of the substrate and around at least a portion of an optical fiber to secure the optical fiber to the substrate. The substrate and the electro-deposited metal are configured to remove heat from the optical fiber. The method could further include electro-depositing metal around a sacrificial material and removing the sacrificial material to form at least one cooling channel through the electro-deposited metal. The optical fiber could include a polymer coating, where a portion of the polymer coating is removed at an end of the optical fiber. The substrate and the electro-deposited metal could be faceted at an input of the optical fiber and at an output of the optical fiber. The optical fiber could have a coiled arrangement on the substrate.

28 Claims, 8 Drawing Sheets